

## INTERNATIONAL SEARCH REPORT

Int'l Application No  
PCT/US2005/001310A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 C01B31/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 C01B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, COMPENDEX

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|------------|---|-----------------------|
| P,X        | KHABASHESKU V N ET AL: "Functionalized carbon nanotubes and nanodiamonds for engineering and biomedical applications" DIAMOND AND RELATED MATERIALS, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 14, no. 3-7, March 2005 (2005-03), pages 859-866, XP004857181<br>ISSN: 0925-9635<br>the whole document<br>-----<br>-/-- | 1-20                  |



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*G\* document member of the same patent family

Date of the actual completion of the international search

10 June 2005

Date of mailing of the international search report

24/06/2005

Name and mailing address of the ISA

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|------------|---|-----------------------|
| X          | STEVENS J L ET AL: "Sidewall amino-functionalization of single-walled carbon nanotubes through fluorination and subsequent reactions with terminal diamines"<br>NANO LETTERS, ACS, WASHINGTON, DC, US, vol. 3, no. 3, 28 January 2003 (2003-01-28), pages 331-336, XP002314112<br>ISSN: 1530-6984<br>"Scheme 1"<br>page 335, column 2, line 4 - line 8<br>----- | 1-9                   |
| X          | PENG HAIQING ET AL: "Sidewall Carboxylic Acid Functionalization of Single-Walled Carbon Nanotubes"<br>J. AM. CHEM. SOC.; JOURNAL OF THE AMERICAN CHEMICAL SOCIETY DEC 10 2003, vol. 125, no. 49, 10 December 2003 (2003-12-10), pages 15174-15182, XP002331483<br>"Scheme 1"; "Conclusion"<br>column 2<br>-----   | 10-20                 |
| A          | GEORGAKILAS V ET AL: "AMINO ACID FUNCTIONALISATION OF WATER SOLUBLE CARBON NANOTUBES"<br>CHEMICAL COMMUNICATIONS - CHEMCOM, ROYAL SOCIETY OF CHEMISTRY, GB, 14 November 2002 (2002-11-14), pages 3050-3051, XP002265590<br>ISSN: 1359-7345<br>the whole document<br>-----   | 1-20                  |

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2005/001310

### Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

### Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/SA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-9

Carbon nanotubes functionalised with amino acid through a bond C (of the nanotube)- N (of the amino acid). Preparation thereof by reacting fluorinated carbon nanotubes with an ester of an amino acid and then hydrolizing.

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2. claims: 10-20

Carbon nanotubes functionalised with amino acids through a C (of the nanotube)- C (of the amino acid) bond. Preparation thereof involving a reaction of the nanotubes with a peroxide species, Br<sub>2</sub> and NH<sub>3</sub>.

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